Citation:

Parsons TJ, Manor O, Power C. Television viewing and obesity: a prospective study in the 1958 British birth cohort. Eur J Clin Nutr. 2008 ; 62(12):1355-63.

PubMed ID: 17717536

Study Design:

Longitudinal prospective study

Class:

B - Click here for explanation of classification scheme.

Research Design and Implementation Rating:

POSITIVE: See Research Design and Implementation Criteria Checklist below.

Research Purpose:

- To assess whether frequency of television viewing in adolescence (11 and 16 years) or early adulthood (23 years) affected subsequent changes in body mass index (BMI) through to mid-adulthood life and waist-hip ratio in mid-adulthood.

Inclusion Criteria:

- Children born in England, Scotland and Wales in 1 week in March 1958 were included.
- Televison watching in adolescence and early adulthood influences.
- Participants with at least one BMI measure.

Exclusion Criteria:

NA

Description of Study Protocol:

Recruitment

All children born in England, Scotland and Wales in 1 week in March 1958 were included in the 1958 birth cohort. From a target population of 17733 births, information was obtained on 98%. At age 45 years, of 11971 individuals invited to participate, 9216 provided BMI data.

Design

The 1958 British birth cohort includes all births in 1 week in March 1958 in England, Scotland and Wales. The main analyses included at least 11301 participants. Outcome measures included BMI at 16, 23, 33 and 45 years and waist-hip ratio at 45 years.

Blinding used (if applicable)

NA

Intervention (if applicable)

Television watching

Statistical Analysis

Measures of BMI at different time points within individuals.

Multilevel models and fitting BMI as a repeated measure.
Random effects at the individual level, intercept and linear slope (change in BMI per year) to vary between individuals.
Linear regression, unadjusted models were repeated using the sample available for adjusted models.
Regression models and other non-multilevel analyses were conducted.
The study also examined whether any of the lifestyle characteristics modified the influence of television viewing on the BMI trajectory, by adding interaction terms of each characteristic and television viewing and age by television viewing.

Data Collection Summary:

Timing of Measurements

Participants reported television-viewing frequency at 11, 16 and 23 years and daily duration at 45 years.

Dependent Variables

- Change in BMI and WHR , television watch

Independent Variables

Frequency of watching by years and time

Control Variables

Television watching, BMI and WHR

Description of Actual Data Sample:

Initial N: 17733 births

Attrition (final N): Follow up of survivng children at age 45 years : 11971 individuals

9216 provided BMI data.

Age: 7,11, 16, 23 , 33, 42 and 45 years

Ethnicity: NA.

Other relevant demographics:

Maternal BMI, healthy eating score, social class, puberty, physical activity, alcohol consumption, cigarette smoking

Anthropometrics Height, weight, BMI and WHR

Location: England, Scotland and Wales

Summary of Results:

- BMI increased with age, and was higher in females than males at 16 years, but higher in males from 23 years onwards.
- The distribution for television viewing was similar for males and females at all three ages.
- A greater proportion of 16-year-olds from manual backgrounds watched television 'often' than adolescents from non-manual backgrounds, and several other potential confounding factors showed weak associations with television viewing at 16 years.
- Watching television often at 16 years (but not 11 years) was associated with a faster gain in BMI between 16 and 45 years in males (0.11 kg m-2 per year, 95% confidence interval (CI) 0.003, 0.019) and females (0.013 kg m^{-2} per year, 95% CI 0.003, 0.023).
- More frequent television viewing at 11, 16 and 23 years were associated with a faster gain in BMI between 23 and 45 years in females, but not in males.
- Television viewing at 23 years was associated with waist-hip ratio at 45 years. Participant's watching≥5 times per week had a waist-hip ratio 0.01 higher than those watching less often.
- At 45 years, those watching television for ≥4 h day^{-1} had a waist-hip ratio 0.03-0.04 higher than those watching for <1h d day^{-1} had a waist-hip ratio 0.03-0.04 higher than those watching for <1 h day^{-1}.
- Approximately two-thirds of boys and girls also watched 'often' at 16 years, while of those who watched television 'sometimes' at 11 years just under half watched 'sometimes' at 16 years. Some associations were seen between 16 and 23 years and between 23 and 45 years.
- Among males, television viewing at 11 years had no effect on BMI at 33 years (model intercept) or on BMI gain either between 16 and 45 years or between 23 and 45 years.
- Females watching television 'often' at 11 years had a higher BMI at 33 years and also experienced a faster gain in BMI between 23 and 45 years by 0.017 kg m^{-2} per year.
- No effect was seen on the BMI trajectory (16-45 years).
- Television viewing at 16 years also showed a positive effect on BMI at 33 years in females but not males.
- Both males and females who watched television 'often' at 16 years had faster gains in BMI at 16 -45 years (by 0.011 and 0.013 kg m^{-2} per year, respectively), as did females between 23 and 45 years (by 0.012 kg m^{-2} per year).
- Television viewing at 23 years had a positive effect on BMI at 33 years in both sexes, and on BMI gain at 23-45 years in females; those watching ≥ 5 times per week gained BMI faster, by 0.029 kg m^{-2} per year than those watching less often.
- In males, the effect of television viewing at 23 years on BMI gain disappeared after transforming BMI using a natural logarithm.
- Estimated effects of television viewing at 16 years on BMI at 33 years or the slope of the BMI trajectory were little or modestly affected by adjusting for earlier BMI, maternal BMI and social class, concurrent physical activity, smoking or alcohol intake, or for adult healthy eating score.
- Adjustment for physical activity at 16 years slightly reduced the effect of television viewing (16 years) on the BMI trajectory (16-45 years), from 0.013 to 0.011 kg m^{-2} per year in

females (no change in effect in males).

- Frequency of alcohol consumption at 23 years slightly reduced the effect of television viewing (23 years) on the BMI trajectory (23-45 years), from 0.010 to 0.08 kg m^{-2} per year in males and 0.029-0.025 kg m^{-2} per year in females.
- Similarly adjusting for life style factors at two ages to allow for change overtime had modest or negligible effect on the relationship between television viewing and the BMI trajectory.
- In females, adjusting for television viewing at 23 years reduced the effect of television viewing at 16 years on the 23-45 years trajectory (from 0.012 to 0.006 kg m^{-2} per year), but not the effect of television viewing at 11 years.
- Interaction terms between television viewing and other lifestyle characteristics concurrent physical activity, smoking, alcohol intake or adult healthy eating score, were not significant with one exception.
- In men, smoking at 16 years modified the effect of television viewing on the BMI trajectory between 16 and 45 years, such that in non-smokers those who watched television 'often' experienced faster gains in BMI (by 0.017 kg m^{-2} per year), whereas in smokers, the trajectory was similar irrespective of the level of television viewing.
- At 45 years, men watching television >4h day-1 had a higher mean BMI by 2.0 kg m^{-2} and higher waist-hip ratio by 0.04 than men who watched television <1 h day^{-1}; corresponding values for women were 3.4 kg m^{-2} and 0.035.
- The relationship between BMI and television was stronger in women, as indicated by a significant BMI by television by gender interaction term (p=0.001) whereas the relationship between waist-hip ratio and television was stronger in men (p=0.05).
- There was no effect of adolescent television viewing (11 or 16 years) on adult waist-hip ratio (at 45 years), but television viewing at 23 years was associated with waist-hip ratio at 45 years; participants watching television ≥5 times per week had a waist-hip ratio 0.01 higher than those watching less often.

Author Conclusion:

- More frequent television viewing in adolescence and early adulthood is associated with greater BMI gains through to mid-adulthood and with central adiposity in mid-life.
- Television viewing may be a useful behavior to target in strategies to prevent obesity.
- The findings suggest that watching television more frequently in adolescence or early adulthood is related to a faster BMI gain through to mid-adult life, particularly in females, and that more frequent television viewing in early adult life increases waist-hip ratio some years later.
- At 45 years, the cross-sectional relationship between television viewing and BMI mirrored the longitudinal relationship, being stronger in women than in men.
- In contrast, the relationship between waist-hip ratio and television viewing at 45 years was stronger in men.
- The reason for gender differences is unclear.
- The continuities in television viewing between one age and the next were similar for males and females.
- Television viewing is one factor among several that impact on subsequent body fatness and weight gain and as such reducing television viewing may be a useful component in strategies for limiting BMI gain and increases in central adiposity.

Reviewer Comments:

- *This is a longitudinal study with retrospective data. Sample size is appropriate to make conclusions of the study.*
- *Further studies are needed to study the effect of TV watching on BMI and WHR and central obesity.*
- *Fast foods during TV watching also influence obesity risk factors. Hence, more research is required to study the life styles in people watching TV and the prevalence and incidence of obesity in children and adults.*

Research Design and Implementation Criteria Checklist: Primary Research

Relevance Questions		
1.	Would implementing the studied intervention or procedure (if found successful) result in improved outcomes for the patients/clients/population group? (Not Applicable for some epidemiological studies)	Yes
2.	Did the authors study an outcome (dependent variable) or topic that the patients/clients/population group would care about?	Yes
3.	Is the focus of the intervention or procedure (independent variable) or topic of study a common issue of concern to nutrition or dietetics practice?	Yes
4.	Is the intervention or procedure feasible? (NA for some epidemiological studies)	Yes

Validity Questions		
1.	**Was the research question clearly stated?**	Yes
1.1.	Was (were) the specific intervention(s) or procedure(s) [independent variable(s)] identified?	Yes
1.2.	Was (were) the outcome(s) [dependent variable(s)] clearly indicated?	Yes
1.3.	Were the target population and setting specified?	Yes
2.	**Was the selection of study subjects/patients free from bias?**	Yes
2.1.	Were inclusion/exclusion criteria specified (e.g., risk, point in disease progression, diagnostic or prognosis criteria), and with sufficient detail and without omitting criteria critical to the study?	Yes
2.2.	Were criteria applied equally to all study groups?	Yes
2.3.	Were health, demographics, and other characteristics of subjects described?	Yes
2.4.	Were the subjects/patients a representative sample of the relevant population?	Yes
3.	**Were study groups comparable?**	Yes

3.1.	Was the method of assigning subjects/patients to groups described and unbiased? (Method of randomization identified if RCT)	N/A
3.2.	Were distribution of disease status, prognostic factors, and other factors (e.g., demographics) similar across study groups at baseline?	N/A
3.3.	Were concurrent controls used? (Concurrent preferred over historical controls.)	N/A
3.4.	If cohort study or cross-sectional study, were groups comparable on important confounding factors and/or were preexisting differences accounted for by using appropriate adjustments in statistical analysis?	Yes
3.5.	If case control or cross-sectional study, were potential confounding factors comparable for cases and controls? (If case series or trial with subjects serving as own control, this criterion is not applicable. Criterion may not be applicable in some cross-sectional studies.)	Yes
3.6.	If diagnostic test, was there an independent blind comparison with an appropriate reference standard (e.g., "gold standard")?	N/A
4.	**Was method of handling withdrawals described?**	N/A
4.1.	Were follow-up methods described and the same for all groups?	N/A
4.2.	Was the number, characteristics of withdrawals (i.e., dropouts, lost to follow up, attrition rate) and/or response rate (cross-sectional studies) described for each group? (Follow up goal for a strong study is 80%.)	N/A
4.3.	Were all enrolled subjects/patients (in the original sample) accounted for?	Yes
4.4.	Were reasons for withdrawals similar across groups?	N/A
4.5.	If diagnostic test, was decision to perform reference test not dependent on results of test under study?	N/A
5.	**Was blinding used to prevent introduction of bias?**	No
5.1.	In intervention study, were subjects, clinicians/practitioners, and investigators blinded to treatment group, as appropriate?	No
5.2.	Were data collectors blinded for outcomes assessment? (If outcome is measured using an objective test, such as a lab value, this criterion is assumed to be met.)	No
5.3.	In cohort study or cross-sectional study, were measurements of outcomes and risk factors blinded?	N/A
5.4.	In case control study, was case definition explicit and case ascertainment not influenced by exposure status?	N/A
5.5.	In diagnostic study, were test results blinded to patient history and other test results?	N/A

6.	**Were intervention/therapeutic regimens/exposure factor or procedure and any comparison(s) described in detail? Were interveningfactors described?**	Yes
6.1.	In RCT or other intervention trial, were protocols described for all regimens studied?	N/A
6.2.	In observational study, were interventions, study settings, and clinicians/provider described?	Yes
6.3.	Was the intensity and duration of the intervention or exposure factor sufficient to produce a meaningful effect?	Yes
6.4.	Was the amount of exposure and, if relevant, subject/patient compliance measured?	No
6.5.	Were co-interventions (e.g., ancillary treatments, other therapies) described?	No
6.6.	Were extra or unplanned treatments described?	No
6.7.	Was the information for 6.4, 6.5, and 6.6 assessed the same way for all groups?	Yes
6.8.	In diagnostic study, were details of test administration and replication sufficient?	N/A
7.	**Were outcomes clearly defined and the measurements valid and reliable?**	Yes
7.1.	Were primary and secondary endpoints described and relevant to the question?	Yes
7.2.	Were nutrition measures appropriate to question and outcomes of concern?	Yes
7.3.	Was the period of follow-up long enough for important outcome(s) to occur?	Yes
7.4.	Were the observations and measurements based on standard, valid, and reliable data collection instruments/tests/procedures?	Yes
7.5.	Was the measurement of effect at an appropriate level of precision?	Yes
7.6.	Were other factors accounted for (measured) that could affect outcomes?	Yes
7.7.	Were the measurements conducted consistently across groups?	Yes
8.	**Was the statistical analysis appropriate for the study design and type of outcome indicators?**	Yes
8.1.	Were statistical analyses adequately described and the results reported appropriately?	Yes
8.2.	Were correct statistical tests used and assumptions of test not violated?	Yes
8.3.	Were statistics reported with levels of significance and/or confidence intervals?	Yes

8.4.	Was "intent to treat" analysis of outcomes done (and as appropriate, was there an analysis of outcomes for those maximally exposed or a dose-response analysis)?	???
8.5.	Were adequate adjustments made for effects of confounding factors that might have affected the outcomes (e.g., multivariate analyses)?	Yes
8.6.	Was clinical significance as well as statistical significance reported?	Yes
8.7.	If negative findings, was a power calculation reported to address type 2 error?	N/A
9.	**Are conclusions supported by results with biases and limitations taken into consideration?**	Yes
9.1.	Is there a discussion of findings?	Yes
9.2.	Are biases and study limitations identified and discussed?	Yes
10.	**Is bias due to study's funding or sponsorship unlikely?**	Yes
10.1.	Were sources of funding and investigators' affiliations described?	Yes
10.2.	Was the study free from apparent conflict of interest?	Yes